

EA14M || Pressure Indicator

The EA14M consists of an electronic module and a pair of separated pressure transmitters. It is an intelligent multi-function instrument that measures and displays pressure and (optionally) transmits the measured value as a standardized 3-wire electrical signal. Its programmable limit detection functions enable it also to act as an accurate and versatile pressure switch.

Principles of Operation

The electronic module converts the analog signal from the pressure sensor and then digitally processes the input value. Its microcontroller provides a high degree of user programmability and tremendous versatility. The electronic module controls the module's digital display and limit signaling on-off outputs, and (optionally) produces a new analog signal output. The readings can be filtered, scaled, inverted, or linearized through a user-defined look-up table.

The external pressure transmitter is connected to the electronic module through flexible signal cables terminated by plug-in connectors. Only the pressure transmitter supplied as part of the instrument set can be used. The pressure ratings of the pressure transmitter and the measuring range of the instrument are matched and calibrated at the factory, and marked accordingly on the product identification label.

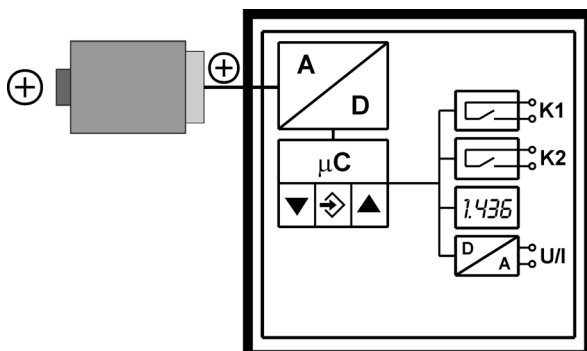


Features

- Large bright LED display
- Selectable pressure units
- 2 independent limits with a choice of logic modes
- optional analogue signal output, with user-programmable scaling, linearization, inversion, and offset adjustment
- User-defined look-up table for signal conversion, with up to 30 points
- Fully programmable from a PC, using the optional Model EU03 PC Adaptor

Typical Applications

- Pressure switch / pressure display for inconvenient accessible measuring places
- Level measurement
- Simplified pump control
- Monitoring of pumps and compressors



Schematic Diagram



Specifications

General

| | | |
|-----------------------------|------------|---------|
| Measuring range | bar | all |
| Straight line error (max.)° | %FS | 0.1 |
| Straight line error (typ.)° | %FS | < 0.05 |
| Tc span (max.)°° | %FS 10K | <0.1 |
| Tc span (typ.)°° | %FS 10K | < 0.025 |
| Tc zero point (max.)°° | %FS 10K | <0.1 |
| Tc zero point (typ.)°° | %FS 10K | <0.025 |

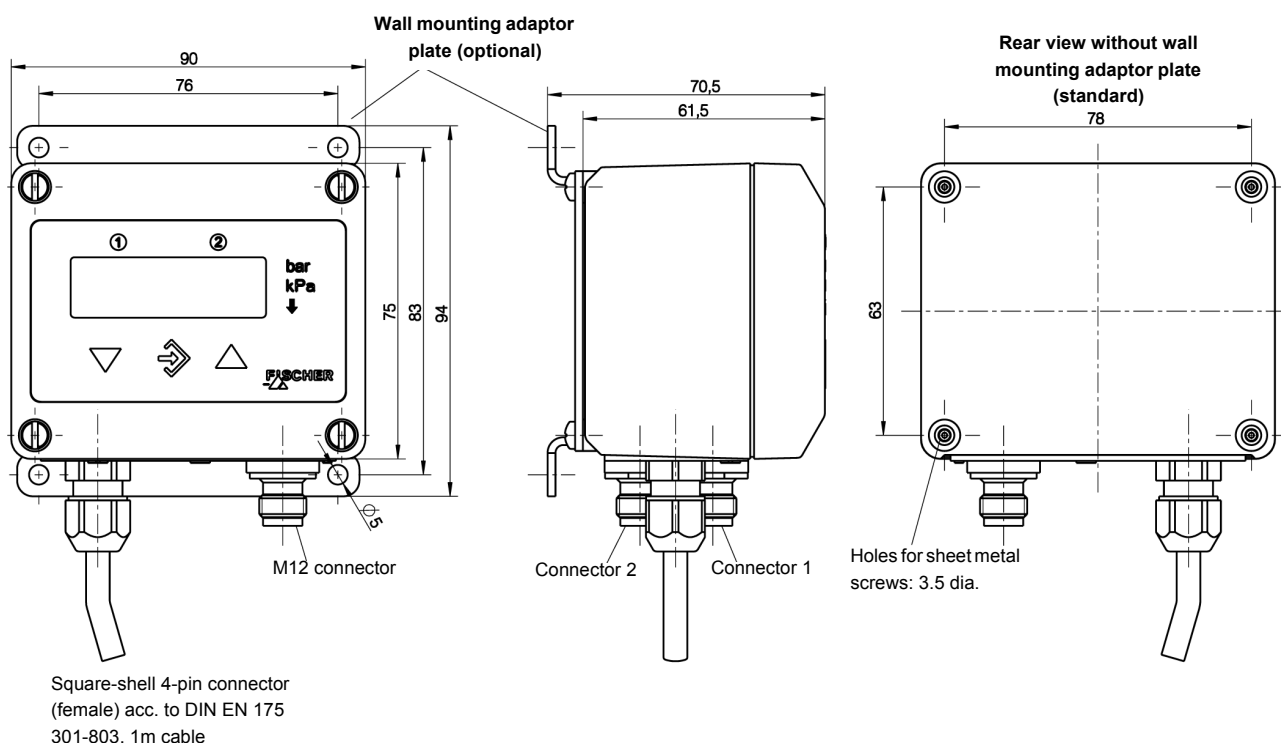
Shown values characterize the electronic module only, values of the attached pressure transmitter are not included (see data sheet of pressure transmitter).

°: Straight line error = nonlinearity + hysteresis; at 25°C; pressure within specified range (characteristic linear, not spreaded)

°°: Pressure within specified range (characteristic linear, not spreaded)

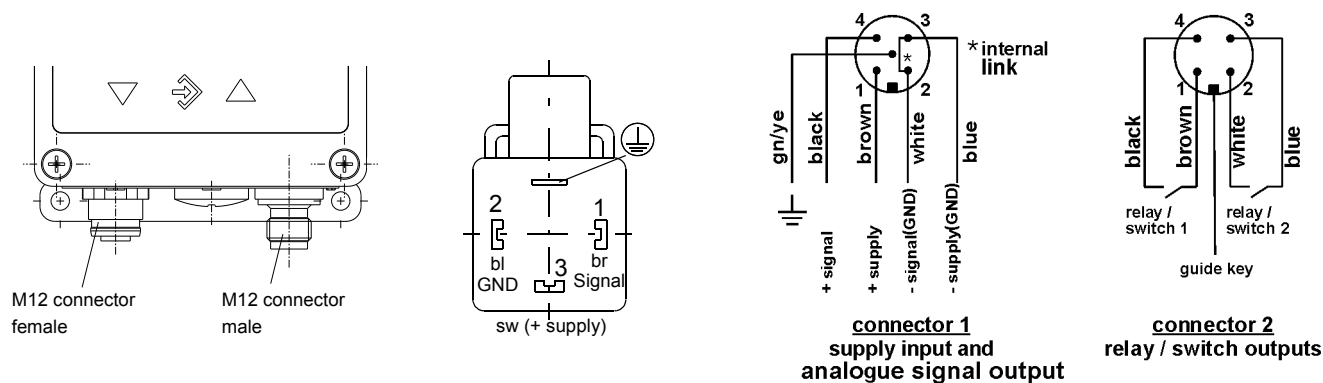
| | |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating temp. (ambient) | -10 ... 70°C |
| Operating temp. (media) | See data sheet pressure transmitter |
| Storage temperature | -20 ... 70°C |
| Protection class (housing) | IP 65 per DIN EN 60529 |
| Electrical | |
| Nominal supply voltage | 24 V DC / AC |
| Operating supply voltage | 12 ... 32 V DC / AC |
| Output signal | 0 ... 20 mA, 4 ... 20 mA, or 0 ... 10 V DC (3-wire) |
| Output signal load | For current output $R_L \leq (U_B - 4 V) / 0,02 A$ ($U_B \leq 26V$), else $R_L \leq 1100 \Omega$ For voltage output $R_L \geq 2 K\Omega$ ($U_B \geq 15 V$), $R_L \geq 10 K\Omega$ ($U_B = 12 \dots 15V$) |
| Power consumption | Approx. 2 W / VA |
| Switching contacts | 2 sets of programmable voltage free relay contacts: N/O or N/C $U_{max} = 32 V DC/AC$, $I_{max} = 2 A$, $P_{max} = 64 W/VA$ Optional, instead of relay outputs: 2 programmable voltage free MOSFET switch outputs, NO/NC $U = 3 \dots 32 V DC/AC$, $I_{max} = 0.25 A$, $P_{max} = 8 W/VA$, $R_{ON} \leq 4 \Omega$ |
| Display | 3½ digit LED |
| Connections | |
| External transmitter supply | Supply of EA14M, fused via PTC (approx. 8 Ω) |
| Max. current | $\leq 250 mA$ for the external pressure transmitter (limited by PTC) |
| Electrical connections | Two round-shell multi-pin connector sockets (M12, male) Connector 1: 5-pin: power input and analog signal output Connector 2: 4-pin: relay contacts / solid-state switch outputs |
| External pressure transmitter | Two round-shell multi-pin connector sockets (M12, female) or square-shell 4-pin connector (female), acc. to DIN EN 175 301-803-A, 1m cable |
| Materials, Mounting | |
| Materials, housing | Polyamide PA6,6 |
| Materials, media contact | See data sheet pressure transmitter |
| Mounting | Mounting holes at rear for panel mounting Wall mountable using adaptor plate If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow. |

Dimensions (all units in mm unless stated otherwise)



Electrical connections

The pinning of connector 1 is also used for the M12 connector for the external pressure transmitter.



Programming

Via membrane key-switches or by using PC-programming interface (accessory).

Programming mode can be password protected.

Settings

| | |
|-------------------------------|-----------------------------------------------------------------------------------------------|
| Input filtering | 0.0...100.0s (10/90% step response time) for signal output, display separated |
| Relay / switch 1/2 | Activation point, de-activation point, response time delay (0...100 secs), logic (N/O or N/C) |
| Measurement unit selection | bar, kPa, „free unit“ start value, end value and decimal place for „free unit“ |
| Output signal start/end value | Can be set at any point of measuring range (2) |
| Zero suppression | 0...100 counts (1) |
| Zero pressure calibration | ±100 counts (3) |
| Output characteristic | Linear, square rooted, horizontal cylindr. tank, table (3...30 entries) |
| Password range | 001 ... 999 (000 = password protection disabled) |

(1) Measured value deviations up to 100 counts, symmetric about zero, are set to zero. Used for zero drift suppression.

(2) Maximum effective turn-down ratio = 4:1. Only the output signal is affected. Transfer function is inverted if start value > end value.

(3) Zero calibration setting may change with mounting orientation.

Ordering Code

Pressure Indicator **EA14** **M** **0** **K** **0** **M**

| | | | | | | | | | | | |
|------------------------------------------------------------------------------|---|---|--|--|--|--|--|--|--|---|---|
| Pressure | M | | | | | | | | | | |
| Measuring range | | | | | | | | | | | |
| 0 ... 0.6 bar..... | 0 | 1 | | | | | | | | | |
| 0 ... 1 bar..... | 0 | 2 | | | | | | | | | |
| 0 ... 1.6 bar..... | 0 | 3 | | | | | | | | | |
| 0 ... 2.5 bar..... | 0 | 4 | | | | | | | | | |
| 0 ... 4 bar..... | 0 | 5 | | | | | | | | | |
| 0 ... 6 bar..... | 0 | 6 | | | | | | | | | |
| 0 ... 10 bar..... | 0 | 7 | | | | | | | | | |
| 0 ... 16 bar..... | 0 | 8 | | | | | | | | | |
| 0 ... 25 bar..... | 0 | 9 | | | | | | | | | |
| 0 ... 40 bar..... | 1 | 0 | | | | | | | | | |
| 0 ... 60 bar..... | 1 | 1 | | | | | | | | | |
| 0 ... 100 bar..... | 1 | 2 | | | | | | | | | |
| 0 ... 160 bar..... | 1 | 3 | | | | | | | | | |
| 0 ... 250 bar..... | 1 | 4 | | | | | | | | | |
| 0 ... 400 bar..... | 1 | 5 | | | | | | | | | |
| -1 ... 0 bar..... | 3 | 1 | | | | | | | | | |
| -1 ... 0.6 bar..... | 3 | 2 | | | | | | | | | |
| -1 ... 1.5 bar..... | 3 | 3 | | | | | | | | | |
| -1 ... 3 bar..... | 3 | 4 | | | | | | | | | |
| -1 ... 5 bar..... | 3 | 5 | | | | | | | | | |
| -1 ... 9 bar..... | 3 | 6 | | | | | | | | | |
| -1 ... 15 bar..... | 3 | 7 | | | | | | | | | |
| 0 ... -1 bar..... | 3 | 9 | | | | | | | | | |
| Electrical connection transmitter | | | | | | | | | | | |
| M12 round-shell multi-pin connector..... | | | | | | | | | | M | |
| Square shell 4-pin connector (f) acc. to DIN EN 175 301-803-A, 1m cable..... | | | | | | | | | | H | |
| Signal input | | | | | | | | | | | |
| 0 - 20 mA, 3-wire (STANDARD)..... | | | | | | | | | | A | |
| 4 - 20 mA, 2-wire..... | | | | | | | | | | B | |
| 0 - 10 V DC, 3-wire (STANDARD)..... | | | | | | | | | | C | |
| Signal output | | | | | | | | | | | |
| No signal output..... | | | | | | | | | | 0 | |
| 0 - 20 mA, 3-wire (STANDARD)..... | | | | | | | | | | A | |
| 0 - 10 V DC, 3-wire (STANDARD)..... | | | | | | | | | | C | |
| 4 - 20 mA, 3-wire (STANDARD)..... | | | | | | | | | | P | |
| Supply voltage | | | | | | | | | | | |
| 24 V DC/AC (12-32 V DC/AC)..... | | | | | | | | | | K | |
| Display and limit switching outputs | | | | | | | | | | | |
| 3½ digit LED display, 2 sets of voltage-free relay contacts..... | | | | | | | | | | | 3 |
| 3½ digit LED display, 2 sets of solid-state switch outputs..... | | | | | | | | | | | 6 |
| Electrical connection | | | | | | | | | | | |
| M12 round-shell multi-pin connectors..... | | | | | | | | | | | M |
| Mounting | | | | | | | | | | | |
| Rear fastening holes (standard)..... | | | | | | | | | | | 0 |
| Wall mounting..... | | | | | | | | | | | W |

Accessories

| Ordering code | Designation | Pins | Application | Length |
|---------------|----------------------------------|-------|---------------------|--------|
| 06401993 | cable with M12 connector | 4-pin | for relay / switch | 2 m |
| 06401994 | cable with M12 connector | 4-pin | for relay / switch | 5 m |
| 06401995 | cable with M12 connector | 5-pin | for supply / signal | 2 m |
| 06401996 | cable with M12 connector | 5-pin | for supply / signal | 5 m |
| 04005144 | wall mounting adapter set | | | |
| EU03.F300 | PC-programming interface with SW | | | |